INFORMATION SHEET 1.2-1

Operating System

LEARNING OBJECTIVES

After reading this INFORMATION SHEET, YOU MUST be able to:

1. Know the meaning of OS.

2. Explain types of operating system and its function.

INTRODUCTION

Operating system is a system software commonly simplified as **"OS".**

An operating system is the most important software that runs on a computer. It manages the computer's memory, processes, and all its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's "language." **Without an operating system, a computer is useless.**

The Operating System's Job

Computer's operating system (OS) manages all of the software and hardware on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's central processing unit (CPU), memory, and storage. The operating system coordinates all of this to make sure each program gets what it needs.

How OS Works

The figure shows below describe the sequential arrangement

Figure 1.1 OS Diagram

TYPES OF OPERATING SYSTEMS

Operating systems usually come preloaded on any computer that you buy. Most people use the operating system that comes with their computer, but it is possible to upgrade or even change operating systems.

The three most common operating systems for personal computers are **Microsoft Windows, Apple Mac OS X, and Linux.**
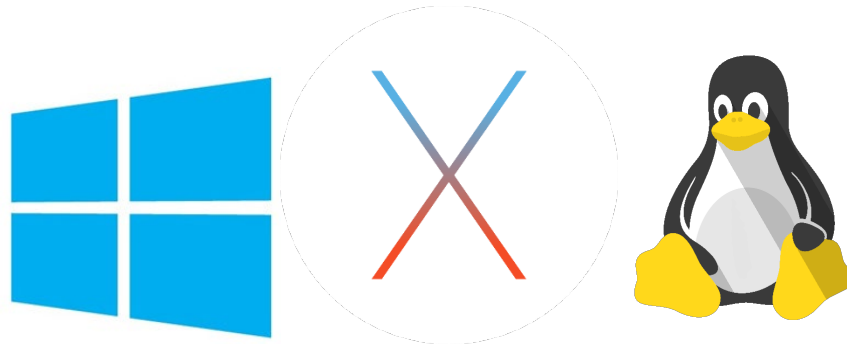
From left, Windows Logo, Mac OS X logo, and Linux Logo

Modern operating systems use a **Graphical User Interface**, or GUI **(pronounced "gooey").** A GUI lets you use your mouse to click on icons, buttons, and menus, and everything is clearly displayed on the screen using a combination of graphics and text.

Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first. However, modern operating systems are designed to be easy to use, and most of the basic principles are the same.

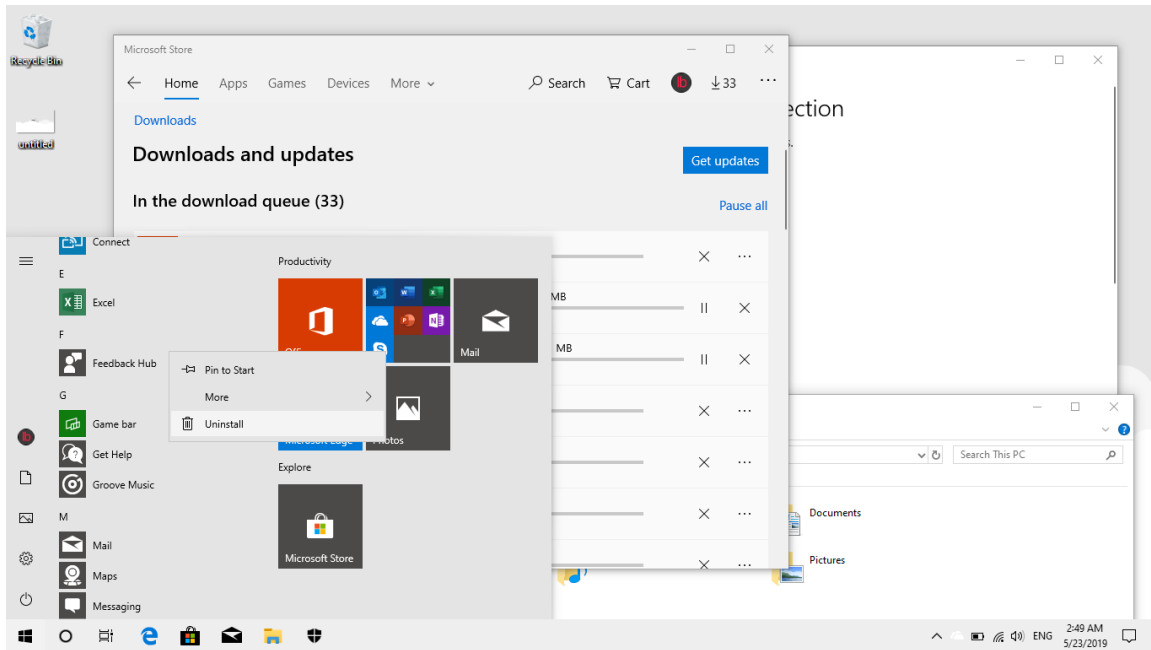*Figure1.3* **The Windows 8.1 GUI**   *Figure1.4* **Mac OS X Yosemite GUI**

Source:
*http://upload.wikimedia.org/wikipedia/en/1/17/OS_X_Yosemite_*
Desktop.png

Before GUIs, computers had a **command-line interface**, which meant the user had to type every single command to the computer, and the computer would only display text.

Microsoft Windows

Windows 10 version 1903, showing the Start menu and Microsoft Store

Microsoft created the Windows operating system in the mid-1980s. Over the years, there have been many different versions of Windows, but the most recent ones are Windows 10 (released in 2015), Windows 8 (2012), Windows 7 (2009), and Windows Vista (2007). Windows comes pre-loaded on most new PCs, which helps to make it the most popular operating system in the world.

History of Windows OS

Windows 1.0	The first independent version of Microsoft Windows, version 1.0, released on November 20, 1985, achieved little popularity.
Windows 2.0	Microsoft Windows version 2 came out on December 9, 1987, and proved slightly more popular than its predecessor.
Windows 3.0	Windows 3.0, released in May 1990, improved capabilities given to native applications. It also allowed users to better multitask older MS-DOS based software compared to Windows/386, thanks to the introduction of virtual memory.
OS/2	During the mid to late 1980s, Microsoft and IBM had cooperatively been developing OS/2 as a successor to DOS. OS/2 1.0, released in 1987, supported swapping and multitasking and allowed running of DOS executables.
WIndows 3.1	In response to the impending release of OS/2 2.0, Microsoft developed Windows 3.1 (first released in April 1992), which included several improvements to Windows 3.0, such as display of TrueType scalable fonts (developed jointly with Apple), improved disk performance in 386 Enhanced Mode, multimedia support, and bugfixes.
Windows NT	Windows NT is a family of operating systems produced by Microsoft, the first version of which was released in July 1993. It is a processor-independent, multiprocessing, multi-user operating system. The first version of Windows NT was Windows NT 3.1 and was produced for workstations and server computers. I
Windows 95	Windows 95 (codenamed Chicago) is a consumer-oriented operating system developed by Microsoft. It was released on August 24, 1995, and was a significant improvement over the company's previous DOS-based Windows products.
Windows NT 4.0	Windows NT 4.0 was the successor of 3.51 (1995) and 3.5 (1994). Microsoft released Windows NT 4.0 to manufacturing in July 1996, one year after the release of Windows 95
Windows 98	On June 25, 1998, Microsoft released Windows 98

	(codenamed Memphis). It included new hardware drivers and the FAT32 file system which supports disk partitions that are larger than 2 GB (first introduced in Windows 95 OSR2)
Microsoft Windows 2000	Microsoft released Windows 2000 in February 2000. It has the version number Windows NT 5.0. Windows 2000 has had four official service packs Windows 2000 was available in four editions: - Windows 2000 Professional - Windows 2000 Server - Windows 2000 Advanced Server - Windows 2000 Datacenter Server
Windows ME	In September 2000, Microsoft released a successor to Windows 98 called Windows ME, short for "Millennium Edition". It was the last DOS-based operating system from Microsoft.
Windows XP	On October 25, 2001, Microsoft released Windows XP (codenamed "Whistler"). The merging of the Windows NT/2000 and Windows 95/98/Me lines was finally achieved with Windows XP. Windows XP uses the Windows NT 5.1 kernel, marking the entrance of the Windows NT core to the consumer market, to replace the aging 16/32-bit branch.
Windows Server 2003	On April 25, 2003 Microsoft launched Windows Server 2003, a notable update to Windows 2000 Server encompassing many new security features, a new "Manage Your Server" wizard that simplifies configuring a machine for specific roles, and improved performance.
Windows XP x64 and Server 2003 x64 Editions	On April 25, 2005, Microsoft released Windows XP Professional x64 Edition and Windows Server 2003, x64 Editions in Standard, Enterprise and Datacenter SKUs. Windows XP Professional x64 Edition is an edition of Windows XP for x86-64 personal computers. It is designed to use the expanded 64-bit memory address space provided by the x86-64 architecture.
Windows Server 2003 R2	Windows Server 2003 R2, an update of Windows Server 2003, was released to manufacturing on December 6, 2005. It is distributed on two CDs, with one CD being the Windows Server 2003 SP1 CD. The other CD adds many optionally installable features for Windows Server 2003.

Windows Fundamentals for Legacy PC	In July 2006, Microsoft released a thin-client version of Windows XP Service Pack 2, called Windows Fundamentals for Legacy PCs (WinFLP). It is only available to Software Assurance customers. The aim of WinFLP is to give companies a viable upgrade option for older PCs that are running Windows 95, 98, and Me that will be supported with patches and updates for the next several years.
Windows Home Server	Windows Home Server (codenamed Q, Quattro) is a server product based on Windows Server 2003, designed for consumer use. The system was announced on January 7, 2007 by Russel Adolfo. Windows Home Server can be configured and monitored using a console program that can be installed on a client PC.
Windows Vista	Windows Vista was released on November 8, 2006 to business customers - consumer versions followed on January 30, 2007. Windows Vista intended to have enhanced security by introducing a new restricted user mode called User Account Control, replacing the "administrator-by-default" philosophy of Windows XP.
Windows Server 2008	Windows Server 2008, released on February 27, 2008, was originally known as Windows Server Codename "Longhorn". Windows Server 2008 builds on the technological and security advances first introduced with Windows Vista, and is significantly more modular than its predecessor, Windows Server 2003.
Windows 7	Windows 7 (codenamed Vienna, formerly Blackcomb is a personal computer operating system developed by Microsoft. It is a part of the Windows NT family of operating systems. Windows 7 was released to manufacturing on July 22, 2009, and became generally available on October 22, 2009, less than three years after the release of its predecessor, Windows Vista. Windows 7's server counterpart, Windows Server 2008 R2, was released at the same time.
Windows Server 2008 R2	Windows Server 2008 R2 is a server operating system produced by Microsoft. It was released to manufacturing (RTM) on July 22, 2009 and launched on October 22, 2009
Windows Home Server	Windows Home Server 2011 code named 'Vail'[25] was released on April 6, 2011. Windows Home Server

	2011 is built on the Windows Server 2008 R2 code base and removed the Drive Extender drive pooling technology in the original Windows Home Server release. Microsoft decided to kill WHS 2011 on July 5, 2012 while including its features into Windows Server 2012 Essentials. Windows Home Server 2011 is supported until April 12, 2016
Windows Thin PC	In 2011, Microsoft introduced Windows Thin PC or WinTPC, which is a feature- and size-reduced locked-down version of Windows 7 expressly designed to turn older PCs into thin clients. WinTPC is available for software assurance customers and relies on cloud computing in a business network.
Windows 8 and Windows Server 2012	On October 26, 2012, Microsoft released Windows 8 to the public. One edition, Windows RT, runs on some system-on-a-chip devices with mobile 32-bit ARM (ARMv7) processors. Windows 8 features a redesigned user interface, designed to make it easier for touchscreen users to use Windows. Windows 8 Release Preview and Windows Server 2012 Release Candidate were both released on May 31, 2012. Product development on Windows 8 was completed on August 1, 2012, and it was released to manufacturing the same day. Windows Server 2012 went on sale to the public on September 4, 2012. Windows 8 went on sale October 26, 2012.
Windows 8.1 and Windows Server 2012 R2	Windows 8.1 and Windows Server 2012 R2 were released on October 17, 2013.
Windows 10	Windows 10 is the current release of the Microsoft Windows operating system. Unveiled on August 30, 2014, it was released on July 29, 2015. It was distributed without charge to Windows 7 and 8.1 users for one year after release.
Windows Server 2016	Windows Server 2016 is a server operating system developed by Microsoft as part of the Windows NT family of operating systems, developed concurrently with Windows 10. The first early preview version (Technical Preview) became available on October 1, 2014 together with the first technical preview of System Center. Windows Server 2016 was released on September 6, 2016 at Microsoft's Ignite conference and became generally available on October 12, 2016.

Windows Server 2019	Windows Server 2019 was announced on March 20, 2018, and the first Windows Insider preview version was released on the same day. It was released for general availability on October 2, 2018
Windows 10 Redstone 5	The Windows 10 October 2018 Update (also known as version 1809 and codenamed "Redstone 5") is the sixth major update to Windows 10 and the fifth in a series of updates under the Redstone codenames. It carries the build number 10.0.17763. The first preview was released to Insiders on February 14, 2018. The update was made available to public consumers on October 2, 2018. On October 6, 2018, Microsoft halted the public rollout of the update due to a serious bug that deletes user's files after updating. On October 9, 2018, Microsoft re-released the update to Insiders, stating that all known issues in the update (including file deletion bug) were identified and fixed
Windows 10 (19h2)	Windows 10 version 1903 (codenamed "19H1") is the seventh major update to Windows 10 and the first to use a more descriptive codename (including the year and the order released) instead of the "Redstone" or "Threshold" codename. The first preview was released to Insiders who opted in to the exclusive Skip Ahead ring on July 25, 2018.
Windows 10 **Codename 19H2**	The next feature release of Windows 10, codenamed "19H2", is the eighth major update to Windows 10 and the second to use a more descriptive codename. No builds from this version have been released to Insiders as Microsoft needs a longer lead time for the development of a further feature release, which is codenamed "20H1". Microsoft stated that builds from 19H2 will be released later in spring 2019 when Version 1903 is ready.
Windows 10 Codename 20H1	The next feature release of Windows 10, codenamed "20H1", is the ninth major update to Windows 10 and the third to use a more descriptive codename. The first preview was released to Insiders who opted in to the exclusive Skip Ahead ring on February 14, 2019
Windows 10 (1903)	The latest Windows 10 1903 (10.0.18362.116) released on (May 19, 2019) **Support Status** All editions except LTSB and LTSC:

	Versions 1507, 1511, 1607, 1703 & 1709 are unsupported.
	Versions 1803, 1809, & 1903 are supported

Apple Mac OS X

Figure1.6 **Laptop running macOS Catalina**

Mac OS is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. All of the recent versions are known as OS X (pronounced O-S Ten), and the specific versions include **El Capitan** (released in 2015), Yosemite (2014), **Mavericks** (2013), **Mountain Lion** (2012), and **Lion** (2011).

Brief history of macOS

Kodiak	On September 13, 2000 Apple released a $29.95 "preview" version of Mac OS X (internally codenamed Kodiak) in order to gain feedback from users.
Cheetah	On March 24, 2001, Apple released Mac OS X 10.0 (internally codenamed Cheetah)
Puma	Later that year on September 25, 2001, Mac OS X 10.1 (internally codenamed Puma) was released
Jaguar	On August 23, 2002, Apple followed up with Mac OS X 10.2 Jaguar, the first release to use its code name as part of the branding.
Panther	Mac OS X 10.3 Panther was released on October 24, 2003
Tiger	Mac OS X 10.4 Tiger was released on April 29, 2005. Apple stated that Tiger contained more than 200 new features.
Leopard	Mac OS X 10.5 Leopard was released on October 26, 2007. It was called by Apple "the largest update of Mac OS X".
Snow Leopard	Mac OS X 10.6 Snow Leopard was released on August 28, 2009, the last version to be available on disc.
Lion	Mac OS X 10.7 Lion was released on July 20, 2011. It brought developments made in Apple's iOS, such as an easily navigable display of installed applications (Launchpad) and (a greater use of) multi-touch gestures, to the Mac.
Moutain Lion	OS X 10.8 Mountain Lion was released on July 25, 2012. It incorporates some features seen in iOS 5, which include Game Center, support for iMessage in the new Messages messaging application, and Reminders as a to-do list app separate from iCal (which is renamed as Calendar, like the iOS app).
Mavericks	OS X 10.9 Mavericks was released on October 22, 2013, as a free update through the Mac App Store worldwide.
Yosemite	OS X Yosemite was released to the general public on October 16, 2014, as a free update through the Mac App Store worldwide. It featured a major overhaul of user interface, replaced skeuomorphism with flat graphic design and blurred translucency effects, following the aesthetic introduced with iOS 7.

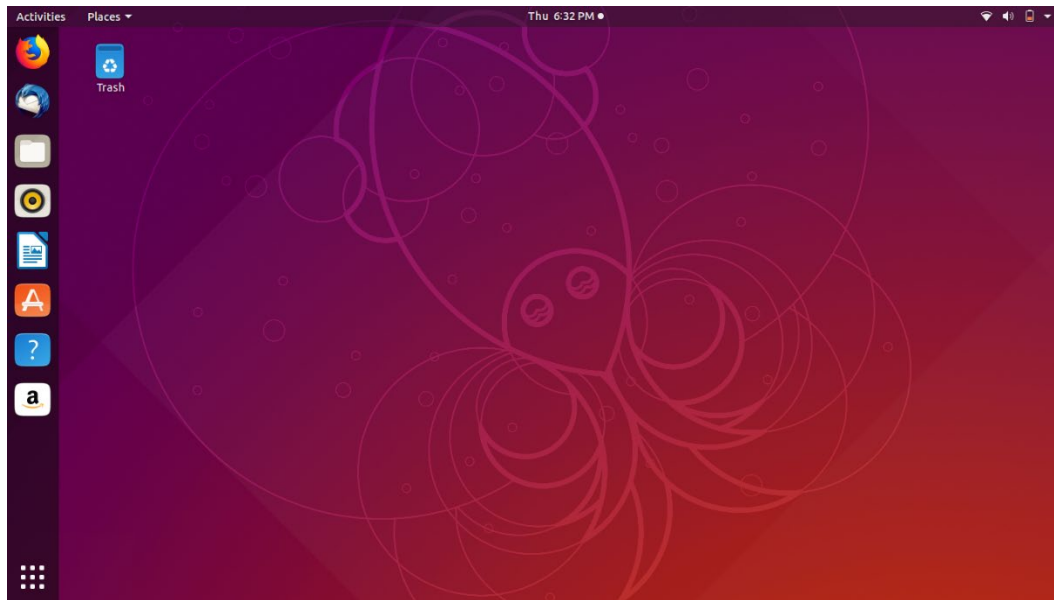| El Capitan	OS X El Capitan was revealed on June 8, 2015, during the WWDC keynote speech. It was made available as a public beta in July and was made available publicly on September 30, 2015. Apple described this release as containing "Refinements to the Mac Experience" and "Improvements to System Performance" rather than new features.
macOS 10.12 Sierra	macOS Sierra was revealed on June 13, 2016, during the WWDC keynote speech. It was released publicly on September 20, 2016.
macOS 10.13 High Sierra	It was released to the public on September 25, 2017. Like OS X El Capitan and OS X Mountain Lion, High Sierra is a refinement-based update having very few new features visible to a user, including updates to Safari, Photos, and Mail, among other changes. The major change under the hood is the switch to the Apple File System, which is optimized for solid-state storage used in most new Mac computers.
macOS 10.14 Mojave	It was released on September 24, 2018. The update introduced a system-wide dark mode and several new apps lifted from iOS, such as Apple News.
macOS Catalina **10.15**	It is the sixteenth major release of macOS, Apple's desktop operating system for Macintosh computers. It is the successor to macOS Mojave and was announced at WWDC 2019 on June 3, 2019. Catalina is the first version of macOS to exclusively support 64-bit applications.

Linux

Figure1.7 Linux Ubuntu 18.10 Desktop Interface

It is a family of open source operating systems, which means that they can be modified and distributed by anyone around the world. This is very different from proprietary software like Windows, which can only be modified by the company that owns it (Microsoft). The advantages of Linux are that it is free, and there are many different distributions (or versions) that you can choose from. Each distribution has a different look and feel, and the most popular ones include Ubuntu, Mint, and Fedora.

Linux is named after Linus Torvalds, who created the Linux kernel in 1991. The kernel is the computer code that is the central part of an operating system.

OPERATING SYSTEMS FOR MOBILE DEVICES

The operating systems that we've been talking about were designed to run on desktop or laptop computers. Mobile devices such as phones, tablet computers, and mp3 players are very different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices. Examples of mobile operating systems include **Apple iOS, Windows Phone, and Google Android.**

Windows 10 Mobile is a mobile operating system developed by Microsoft. It is an iteration of the Windows Phone product line and a successor to Windows Phone 8.1,but is marketed as being an edition of Windows 10, Microsoft's operating system for personal computers, as part of Microsoft's plans to unify Windows' application platform across multiple device classes.

It is designed for use on smartphones and phablets, running on ARM as well as IA-32 processor architectures. Windows 10 Mobile entered public beta for selected Lumia brand smartphones on **February 12, 2015.** The first Lumia smartphones powered by Windows 10 Mobile were released on **November 20, 2015** while eligible Windows Phone devices began receiving updates to Windows 10 Mobile on **March 17, 2016**, pursuant to manufacturer and carrier support.
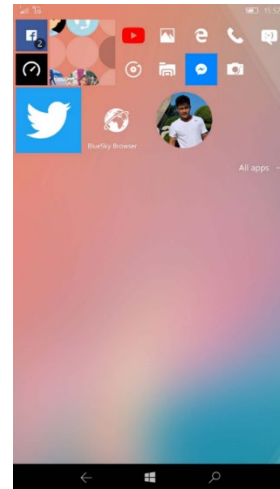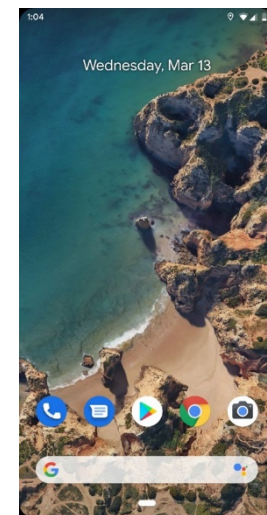
Android "Q" is the upcoming tenth major release and the 17th version of the Android mobile operating system. The first beta of Android Q was released on March 13, 2019 for all Google Pixel phones. The final release of Android Q is scheduled to be released in the third quarter of 2019.

Features of Android Q include:

Allows users to control when apps have permission to see their location: never, only when the app is in use (running), or all the time (when in the background).

- New permissions to access in background photos, video and audio files.
- Built-in screen recorder.
- Background apps can no longer jump into the foreground.
- Improved privacy: limited access to non-resettable device identifiers.
- Sharing shortcuts, which allow sharing content with a contact directly.

- Floating settings panel, that allow changing system settings directly from apps.
- Dynamic depth format for photos, which allow changing background blur after taking a photo.
- Support for the AV1 video codec, the HDR10+ video format and the Opus audio codec.
- A native MIDI API, allowing interaction with music controllers.
- Better support for biometric authentication in apps.
- Built-in foldable phone support for apps and Android itself.

Android OS version history

Code name	Version number	Initial release date	API level
N/A	1.0	23 September 2008	1
	1.1	9 February 2009	2
Cupcake	1.5	27 April 2009	3
Donut	1.6	15 September 2009	4
Eclair	2.0 – 2.1	26 October 2009	5–7
Froyo	2.2 – 2.2.3	20 May 2010	8
Gingerbread	2.3 – 2.3.7	6 December 2010	9–10
Honeycomb	3.0 – 3.2.6	22 February 2011	11–13
Ice Cream Sandwich	4.0 – 4.0.4	18 October 2011	14–15
Jelly Bean	4.1 – 4.3.1	9 July 2012	16–18
KitKat	4.4 – 4.4.4	31 October 2013	19–20
Lollipop	5.0 – 5.1.1	12 November 2014	21–22
Marshmallow	6.0 – 6.0.1	5 October 2015	23
Nougat	**7.0**	22 August 2016	**24-25**
Oreo	8-0-8.1	August 21,2017	**26-27**
Pie	9.0	August 6, 2018	**28**

Code name	Version number	Initial release date	API level
Android Q	10	No official release date as of August 2019	**29**

iOS 12 is the twelfth and current major release of the iOS mobile operating system developed by Apple Inc., being the successor to iOS 11. It was announced at the company's Worldwide Developers Conference on June 4, 2018. It is similar in aesthetics to iOS 11 but contains numerous performance and battery life improvements and security updates, in addition to added functionalities within native applications. It was released to the public on September 17, 2018.
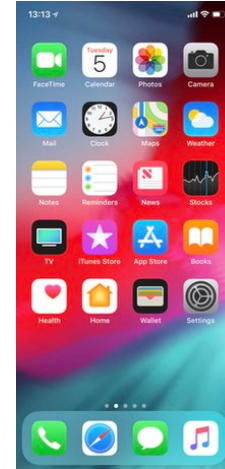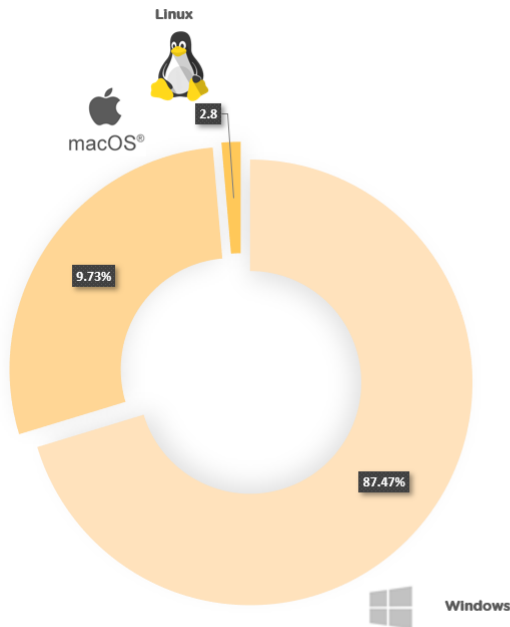
iOS version history

Current versions

Version	Build	Processor support	Application support	Kernel	Release date	Device end-of-life		
						iPad	iPhone	iPod Touch
3.1.3	7E18	32-bit ARM			Feb 2, 2010	N/A	1st gen	1
4.2.1	8C148				Nov 22, 2010		3G	2
5.1.1	9B206				May 7, 2012	1st gen	N/A	3
6.1.6	10B500				Feb 21, 2014	N/A	3GS	4
7.1.2	11D257	32/64-bit ARM[1][2]			Jun 30, 2014		4	N/A
9.3.5	13G36				Aug 25, 2016	2, 3, Mini 1	4S	5
10.3.3	14G60				Jul 19, 2017	4	5, 5C	N/A
12.2	16E227	64-bit ARM[3]			Mar 25, 2019	N/A		
12.3 Beta 1	16F5117h				Mar 27, 2019			

Legend: ☐ Discontinued ☐ **Current** ☐ Beta

(c) Wikipedia

Operating Systems for mobile devices generally aren't as fully-featured as those made for desktop or laptop computers, and they aren't able to run all of the same software. However, you can still do a lot of things with them, such as watching movies, browsing the internet, managing your calendar, playing games, and more.

Linux

2.8
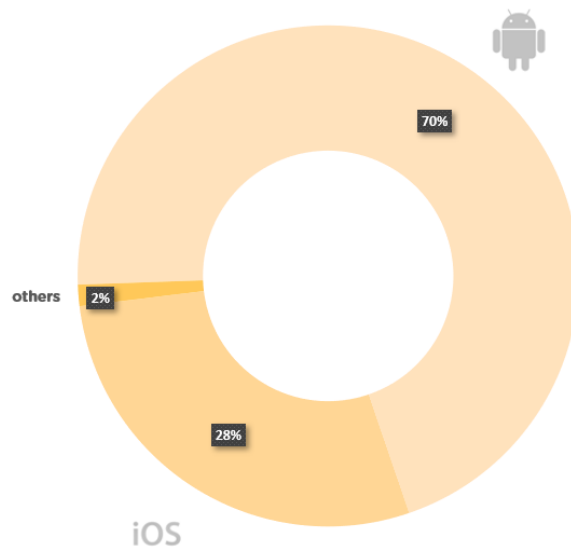
macOS®

9.73%

87.47%

Windows

Windows operating system is the no. 1 desktop operating system in the world.

netmarketshare.com

Android is the most popular mobile operating system. It dominates the 70% of mobile users world wide.

netmarketshare.com

70%

others 2%

28%

iOS

SELF CHECK 1.2-1

I. Multiple Choice Directions: Read each question and their corresponding answers carefully and completely. Choose the answer that best fits the question. Please circle the appropriate letter.

1. What is OS?

   a. Operating System
   b. Operation System
   c. Operate System
   d. Operation Procedure

2. What is the correct sequence of diagram describes the operation of operating system.

   a. Hardware-Apps-User-OS

   b. OS-User-Apps-Hardware

   c. User-Apps-OS-Hardware

   d. OS-User-Hardware-Apps

3. It lets you use your mouse to click on icons, buttons, and menus, and everything is clearly displayed on the screen using a combination of graphics and text.

   a. CLI
   b. GUI
   c. OS
   d. Apps

4. It manages the computer's memory, processes, and all of its software and hardware.

   a. Operating system
   b. software
   c. Windows 7
   d. Application Software

5. According to StatCounter Global Stats, Linux users account for less than __% of the operating systems market as of January 2013.

   a. 1%
   b. 10%
   c. 100%
   d. 50%

II. Enumeration: Enumerate the following.

1-3. Give three mobile operating system

4-5. Give two desktop operating system.

ANSWER KEY 1.2-1

Multiple Choice

1. A
2. C
3. C
4. A
5. A

Enumeration

1-3. iOs8, Windows Phone 8.1,10, Android Nougat

4-5. Windows 7, Windows 8.1,10, Mac OS X Yosemite, El Capitan Linux Ubuntu, Windows Xp